

WHAT IS CLAIMED IS:

1 1. For use in a fixed wireless access network comprising a
2 plurality of base stations capable of bidirectional time division
3 duplex (TDD) communication with wireless access devices disposed at
4 a plurality of subscriber premises, a radio frequency (RF) modem
5 shelf comprising:

6 a first RF modem capable of communicating with a
7 plurality of said wireless access devices using TDD frames, each
8 TDD frame having an uplink for receiving data and a downlink for
9 transmitting data; and

10 a modulation controller associated with said RF modem
11 shelf capable of determining an optimum modulation configuration
12 for each of said plurality of wireless access devices communicating
13 with said first RF modem, wherein said modulation controller causes
14 said first RF modem to transmit downlink data to a first wireless
15 access device in a first data block having a first optimum
16 modulation configuration and to transmit downlink data to a second
17 wireless access device in a second data block having a different
18 second optimum modulation configuration.

1 2. The RF modem shelf as set forth in Claim 1 wherein said
2 modulation controller determines said first and second optimum
3 modulation configurations based on channel conditions associated
4 with channels used to communicate with said first and second
5 wireless access devices.

1 3. The RF modem shelf as set forth in Claim 2 wherein said
2 first modulation configuration comprises a first modulation format
3 and said second modulation configuration comprises a different
4 second modulation format.

1 4. The RF modem shelf as set forth in Claim 3 wherein said
2 second modulation format is more complex than said first modulation
3 format if channel conditions associated with a first channel used
4 to communicate with said first wireless access device are noisier
5 than channel conditions associated with a second channel used to
6 communicate with said second wireless access device.

1 5. The RF modem shelf as set forth in Claim 4 wherein said
2 first and second modulation formats comprise one of binary phase
3 shift keying (BPSK), quadrature phase shift keying (QPSK), and
4 16 quadrature amplitude modulation (QAM).

1 6. The RF modem shelf as set forth in Claim 3 wherein said
2 first modulation configuration comprises a first forward error
3 correction code level and said second modulation configuration
4 comprises a different second forward error correction code level.

1 7. The RF modem shelf as set forth in Claim 6 wherein said
2 first error correction code level is more complex than said second
3 error correction code level if channel conditions associated with
4 a first channel used to communicate with said first wireless access
5 device are noisier than channel conditions associated with a second
6 channel used to communicate with said second wireless access
7 device.

1 8. The RF modem shelf as set forth in Claim 2 wherein said
2 first modulation configuration comprises a first physical beam
3 forming technique and said second modulation configuration
4 comprises a different second physical beam forming technique.

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1 9. A fixed wireless access network comprising:

2 a plurality of base stations capable of bidirectional
3 time division duplex (TDD) communication with wireless access
4 devices disposed at a plurality of subscriber premises; and

5 a radio frequency (RF) modem shelf comprising:

6 a first RF modem capable of communicating with a
7 plurality of said wireless access devices using TDD frames,
8 each TDD frame having an uplink for receiving data and a
9 downlink for transmitting data; and

10 a modulation controller associated with said RF
11 modem shelf capable of determining an optimum modulation
12 configuration for each of said plurality of wireless access
13 devices communicating with said first RF modem, wherein said
14 modulation controller causes said first RF modem to transmit
15 downlink data to a first wireless access device in a first
16 data block having a first optimum modulation configuration
17 and to transmit downlink data to a second wireless access
18 device in a second data block having a different second
19 optimum modulation configuration.

1 10. The fixed wireless access network as set forth in Claim 9
2 wherein said modulation controller determines said first and second
3 optimum modulation configurations based on channel conditions
4 associated with channels used to communicate with said first and
5 second wireless access devices.

1 11. The fixed wireless access network as set forth in
2 Claim 10 wherein said first modulation configuration comprises a
3 first modulation format and said second modulation configuration
4 comprises a different second modulation format.

1 12. The fixed wireless access network as set forth in
2 Claim 11 wherein said second modulation format is more complex than
3 said first modulation format if channel conditions associated with
4 a first channel used to communicate with said first wireless access
5 device are noisier than channel conditions associated with a second
6 channel used to communicate with said second wireless access
7 device.

1 13. The fixed wireless access network as set forth in
2 Claim 12 wherein said first and second modulation formats comprise
3 one of binary phase shift keying (BPSK), quadrature phase shift
4 keying (QPSK), and 16 quadrature amplitude modulation (QAM).

1 14. The fixed wireless access network as set forth in
2 Claim 10 wherein said first modulation configuration comprises a
3 first forward error correction code level and said second
4 modulation configuration comprises a different second forward error
5 correction code level.

1 15. The fixed wireless access network as set forth in
2 Claim 14 wherein said first error correction code level is more
3 complex than said second error correction code level if channel
4 conditions associated with a first channel used to communicate with
5 said first wireless access device are noisier than channel
6 conditions associated with a second channel used to communicate
7 with said second wireless access device.

1 16. The fixed wireless access network set forth in Claim 10
2 wherein said first modulation configuration comprises a first
3 physical beam forming technique and said second modulation
4 configuration comprises a different second physical beam forming
5 technique.

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